IEEE P802.11  
Wireless LANs

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| TG ax Scenarios  Proposed Text additions to 14/980 for frequency re-use | | | | |
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Abstract

This document contains proposed changes to document 14/980 to add to the scenarios such that DSC and related technologies that attempt to improve frequency reuse can be better simulated and evaluated.

**CID 166**

# Background

DSC and related technology is perceived to increase the channel reuse across an area and hence increase the total throughput of that area.

Hence, some of the factors that are important are:

* The area size
  + The more possibility of channel reuse
* The number of available channels
  + Random selection or intelligent selection
  + 40MHz, 80MHz.

# Proposed Edits

## Residential Scenario

Operating channel:

Proposed Text Changes

A - 2.4GHz: random assignment of 3 20MHz non-overlapping channels

B - 5GHz: random assignment of [3], 5, 80MHz non-overlapping channels, with random selection of primary channel per operating channel.

C - 5GHz: random assignment of 10, 40 MHz non-overlapping channels, with random selection of primary channel per operating channel

D - 5GHz: intelligent assignment of 10, 40 MHz non-overlapping channels, with random selection of primary channel per operating channel

Note: Intelligent selection entails looking for free channel then only if no free channel available, select one already in use.

## Enterprise Scenario

Channel allocation

Proposed Text Changes

5GHz:

A - Four 80 MHz channels (Ch1, Ch2, Ch3, Ch4)

The channel distribution can be:

Ch1: BSS 4k-3

Ch2: BSS 4k-2

Ch3: BSS 4k-1

Ch4: BSS 4k

k=1~8, is the office index.

B - Nine 40MHz channels arranged across the 8 Offices as shown below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 |
| 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 |
| 7 | 8 | 9 | 7 | 8 | 9 | 7 | 8 |
| 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 |

## Indoor Small

Add Figure 7a to cover case for frequency reuse 7.



Figure 7a – Layout of BSSs channel allocations in case of 7 channel reuse.

Add Reuse 7 and wall loss. With 10m cell radius and a topology of 180m across the assumption of no obstruction losses is not realistic. It is proposed to add a simple wall loss for each cell wall.

ADD

Reuse 7

STAs are placed randomly (uniform distribution) within the 61 cell area that covers the reuse 7 pattern in Figure 7a. STA identifies which (of the 61) APs from which it receives the highest power (based on distance-based pathloss and shadowing). If the corresponding AP does not yet have N1 STAs associated to it, then STA associates to it; else STA is removed from the simulation. This process is repeated until each of the co-channel APs has exactly N1 STAs associated to it.

Channel Model

PL(d) = 40.05 + 20\*log10(fc/2.4) + 20\*log10(min(d,10)) + (d>10) \* 35\*log10(d/10) + 7\*W

d = max(3D-distance [m], 1)

fc = frequency [GHz]

W = number of cell walls traversed

Primary Channels

5GHz:

A- 80 MHz BSS

[Reuse 3] or reuse 1

Per each 80MHz use same primary channel across BSSs

B- 40 MHz BSS

Reuse 7

Per each 40MHz use same primary channel across BSSs

## Outdoor Large BSS Scenario

Center Frequency, BW and primary channels

Delete: Frequency reuse 1 is used.

5GHz

A- All BSSs are using the same 80MHz channel

[Same Primary channel]

B- BSSs use 40MHz channels with reuse 7

2.4GHz

All BSSs are 20MHz BSS on same channel